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REPORT OF THE COMMITTEE OF NEW YORK STATE MEDICAL
SOCIETY ON THE CAUSES AND PREVENTION OF
BLINDNESS

Two years ago a committee was appointed by this Society to investigate the question of blindness due to contagious ophthalmia in this State and in the United States, and to recommend means for its prevention. The importance and extent of the subject were so great that at the meeting one year ago it was only possible to report progress, and ask that more time be given for the work. This was rendered necessary also by the fact that our lamented colleague, Dr. Agnew, was unable to render the valuable assistance upon which we had counted, and only recently has his place on the committee been satisfactorily filled. Even now it seems advisable to give a synopsis of the more important features of the subject instead of attempting to go into many details which are not only of interest to the ophthalmologist but also of importance from a sanitary point of view. The reasons for this investigation concerning the increase of blindness will become apparent if a statement is first made of the statistical facts. In presenting these it will be necessary to repeat to a certain extent the statements made in a paper by the chairman of this committee, which was published in the *Transactions of the American Ophthalmological Society* in 1887. As far as we are aware, however, these statistics have not been stated in a similar manner anywhere else. When we compare the report of the United States Census of 1870 with the report of 1880, we find the population of the United States in 1870 was 38,558,371, and the number of blind then was 20,320. Whereas, the population in 1880 was 50,155,783, and the number of blind was 48,929. *In other words, while the population of the entire country had increased 30.09 per cent., the number of blind had increased 140.78 per cent.*

It is worth while in passing to call attention to the distribution of the blind throughout the country, and in doing so to quote the figures in the paper already mentioned. If the United States be

divided into three parts, according to latitude—the first, or southerly range of States, including those which lie below the 35th parallel; the second range between the 35th and 40th, and the third above that—we find there is a constant increase in the ratio as we pass from the North toward the South. Thus there are: In the northerly range of States, 7.9 blind in each 10,000; in the middle range of States, 9.42 blind in each 10,000; in the southern range of States, 10.81 blind in each 10,000. This is shown in diagram No. 3.

There is another classification of the States which is also of some interest. If they be divided according to longitude into three groups, each of which includes about fifteen degrees, we find the proportion of blindness decreases as we go from East to West. According to this division, the first group of States would lie between the Atlantic Ocean and the Mississippi River, extending to about the 15th degree of longitude west from Washington; the second would be from the Mississippi to the Rocky Mountains, or from the 15th to the 30th degree; while the third would include the strip from the Rocky Mountains to the Pacific Ocean, or from the 30th degree of longitude west. Here we find: In the easterly range of States, 10.34 blind to each 10,000; in the middle range of States, 7.90 blind to each 10,000; in the western range of States, 5.68 blind to each 10,000. This is shown in diagram No. 4.

So much for the statistics relating to the United States as to the number of blind, their increase throughout the country as a whole, and their distributions in different parts of it.

Let us next consider the statistics which are available relating to New York State alone. The population in New York State in 1870 was 4,382,759, and in 1880 was 5,082,871; being an increase of 15.9 per cent. Whereas the number of blind in New York State in 1870 was 2213, and in 1880 was 4981; being an increase of 125.07 per cent.

In a similar manner, if we compare the State Census of 1875 with the United States Census of 1880, we find the population in 1875 was 4,698,958, and in 1880 was 5,082,871; being an increase of 8.1 per cent. While the number of blind in 1870 was 2256, and in 1880 was 4981; being an increase of 111.03 per cent. *In other words, the official reports show that during the ten years preceding 1880, blindness in the State of New York increased 8.2 times as rapidly as did the population, and during the last five years of that decade it increased 13.7 times as rapidly.*

It may be interesting also to glance at the distribution of blind throughout the State of New York. The 10th United States Census gives, for the first time, the number of these unfortunates in the different counties of each State. These statistics are in process of publication, but as that portion of the report was not complete when this one was being prepared, application was made to the State Board of Charities, where there is deposited a copy of the official returns relating to the blind. The assistant secretary of the Board, Mr. James O. Fanning, has kindly furnished the committee with the number of blind in each county, having ascertained that by adding the lists of more than five thousand names on record. The different counties have been arranged in four groups. The first includes this which contain less than 0.005 per cent. The second, which contain from 0.005 to 0.01. The third, 0.01 to 5 per cent. The fourth, more than 0.0521 per cent.

In view of these rather startling assertions in regard to the increase of blindness, it is natural that we should question the correctness of the data which lead to any such conclusions—in other words, to suspect that the apparently rapid increase was due to the difference in the manner in which the statistics were collected in 1870 as compared with 1880. In the compendium of the Tenth Census it is stated by Mr. Wines, who has charge of that department, that the plan was essentially the same, but in order to satisfy ourselves more thoroughly a letter was addressed to the Secretary of the Interior, asking for any additional facts in regard to this point, but ~~it was~~ ^{we were} informed that the same outline was followed in one case as in the other; simply a special blank for the blind being filled out in 1880, like the one here presented, entitled Schedule 4. Of course, these examinations were by no means as accurate as would be desired from the ophthalmological point of view, for the enumerators were often ignorant and careless men, but the fact remains that the errors were probably almost as great in 1870 as in 1880. Moreover, in order to verify the accuracy of some of the figures in the last census, ~~we~~ ^{we} made application for the returns regarding the city of Buffalo, and while a number of changes of residence were made and it was difficult to verify the reports in detail, still, the information, obtained as far as it went, showed that at least that part of the report was quite as reliable as could be expected.

Let us consider, next, the causes which tend to make this apparent increase of blindness. In doing so, it is natural that we

inquire, first of all, what were the causes which have produced that condition among those who are already blind. To determine this, it seemed advisable to undertake the examination of a considerable number of these unfortunates, and, of course, that could be done most conveniently in asylums, almshouses, where they were collected together; accordingly a list of questions was prepared, being mainly a copy of that which was used by Hugo Magnus,¹ a specimen of which is here appended.

Name of the Blind Asylum.

Location.

Date of the examination.

Name of the Examining Physician.

1. Name of the Blind Person.

Residence.

Name of Father or Guardian.

Residence.

2. Sex.

3. Age.

4. Religion.

5. Nationality.

6. For Adults, occupation before blindness.

“ Children, “ of the parents.

7. Color of the hair.

8. Color of the Iris, if possible.

9. Degree of blindness.

A. Count fingers at 1-3 metre.

B. Quantitative perception of light.

C. Absolute Amaurosis.

10. Cause of the blindness of the right eye.

11. “ “ “ “ left “

12. Condition of the right eye.

13. “ “ left “

14. Age at which right was lost?

15. “ “ left “ “

16. Can the blindness be referred to scrofula?

17. Can it be referred to syphilis?

18. Is the blindness the result of any disease of the general system?

19. Are there any other bodily infirmities?

¹ Die Jugend Blindheit, p. 6.

- For those who have had smallpox. } 20. Was the blindness before vaccination?
 } 21. Was the vaccination effectual?
22. Did the blindness occur when in a town, or when in the country?
23. Were the parents related to each other?
24. Did the parents have normal vision?
25. Were any of the relatives blind?
26. Were there any other circumstances which might be important in connection with the case.

To the president of each county medical society we then forwarded as many of these blanks as there were blind inmates of his county almshouse, and the request was made that the blanks be filled and returned to the Chairman of this Committee. The accompanying table gives the list of those from whom replies were received, together with the number of examinations made by each. From this, it will be seen that responses were returned in only 19 instances, although letters with blanks were sent to all. Unfortunately, also, the answers to some of the questions were so indefinite that it was necessary to omit the cases from the classification.

County.	Examining Physician.	Address.	No.
Albany,	James F. Earley,	264 Clinton Ave., Albany,	5
Chemung,	N. S. Messenger,	Beesport,	3
Chenango,	D. M. Lee,	Oxford,	2
Columbia,	Azro Chase Hoquor,	Chatham,	5
Dutchess,	I. W. Pouche,	Poughkeepsie,	6
Erie,	H. Y. Grant,	Buffalo,	21
Fulton,	Frank Beebe,	Johnstown,	3
Jefferson,	J. B. Law,	5
Montgomery,	D. M. McMartin,	Amsterdam,	4
Niagara,	J. B. Cosford,	Lockport,	2
Onondaga,	Chas. E. Bozaton,	Onondaga Hill, N. Y.	14
Rensselaer,	C. B. Herrick,	127 Third Street, Troy,	12
Richmond,	Isaac L. Millspaugh,	Richmond,	1
Schenectady,	John A. Heatly,	Schenectady,	1
Suffolk,	C. A. Baker,	Yaphauk,	1
Sullivan,	W. G. Steele,	Mongaup Valley,	1
Ulster,	Silas Soyton,	Neu Platz,	1
Washington,	John C. Gill,	Argyle,	3
Westchester,	Frank D. Revere,	Sing Sing,	4

A second set of examinations which the Committee have to acknowledge was made by Dr. W. H. Bates, of New York, acting under the supervision of Dr. H. D. Noyes. This list includes 168 cases seen at the New York State Institution for the Blind in New

York. The third list contains the results of an examination of 128 inmates of the New York State Institution for the Blind at Batavia. These examinations were made by the Chairman, assisted by Dr. Elmer Starr, of Buffalo. The results, as ascertained by these investigations as to the causes of blindness already existing here, is shown in the accompanying diagram No. 5.

In spite of this plan of inquiry, it is difficult to determine exactly some of the causes of the blindness, even when the greatest care was exercised, but it was evident from even the most casual examination that a very large percentage of the cases were due to some form of contagious disease of the eye. In the accompanying diagrams the causes are shown by the percentage of diseases producing blindness.¹ Those which are due to contagious diseases are represented in black. It will be noticed that one very large column is in both the black and red, showing that it was impossible to say definitely, even after the closest questioning, whether all those cases were due to contagion, but the evidence tended to show that such was the case in such a large proportion that, only for the sake of perfect fairness, is admixture of the other cases shown in this column. The remaining causes are shown in colors, which, for another purpose than the one considered in the present paper, are divided into red and green. It must be admitted that in the case of blind asylums this representation, however truthful in itself, has a tendency to exaggerate the importance of the contagious disease of the eye as a cause of blindness. We do not find at such an institution those who have become blind by accident to adult life, or by those diseases which are more common in old age. In order to answer this question, we reproduce a similar table of percentages which is given by Magnus in his admirable work on blindness. In this table he brought together the results of examinations by different investigators which covered a total of 2528 cases of blindness. In copying this table, we have again represented in black those diseases which are distinctly of a contagious kind, and it will be seen at a glance how very great is the influence of these as compared with any other—over 20 per cent. of those of all ages being due to contagion. Finally, lest there should be the least possible doubt still left as to the importance of this factor in the production of blindness, we reproduce still another statistical diagram, No. 5, which

¹ The Committee on Publication regret that it has not been possible to reproduce the elaborate diagrams which were exhibited in connection with this report.

was constructed from statistics published in the annual report of the Manhattan Eye and Ear Infirmary for the year 1886. In this is given a summary of 48,509 cases, of which it was shown that 26 per cent. were due to conjunctival diseases, and 25.5 per cent. to corneal diseases. This is represented in both black and red, for the reason that a certain number included in these two percentages could not rightly be called contagious diseases, but one of those who made this report, when speaking of them, mentions "over 50 per cent. as being communicable, or closely related to communicable diseases." In summing up, therefore, this portion of the question as to what are the causes which have produced blindness, it is fair, we think, to reply that contagion exercises by far the most important influence.

There is another aspect of this part of the subject which it is necessary to mention; ~~we~~ have reference to the influence which immigration has upon the increase and spread of contagious diseases of the eye, directly and indirectly. A considerable number of facts might be presented to illustrate this phase of the subject. I need only select as an example the influence exerted by one class of immigrants in relation to spreading one disease of the eye. It is generally conceded that trachoma is essentially contagious, and also is of frequent occurrence among the lower class of the Irish population. Now the report of the Treasury Department for 1886 shows that from 1871 to 1880 there were nearly half a million of Irish immigrants in this country, more exactly, 444,589, and during these years the Irish formed 15.1 per cent. of all the immigrants who arrived in the United States. It should be borne in mind that by far the greater part of these immigrants—at least four-fifths of them, land at Castle Garden. In order, therefore, to ascertain what care was exercised in isolating any such contagious cases which might enter there, a letter was addressed to the physician in charge of the State Emigrant Refuge and Hospital at Ward's Island, New York, inquiring as to this point and his replies, although frankly given, were by no means such as to impress one with the care which the authorities exercise as to the disposition of such cases.

Few persons appreciate how great is the cost to the community of maintenance of a number of persons in their midst who are not only non-producers but who must also be fed and clothed. It is possible to make an estimate of the annual cost to the State for the maintenance of the blind. Supposing they were all provided for in

an economical manner, such as can be done in large institutions, it is fair to estimate the cost of keeping each one at \$2 per week, or \$104 per year; to which should be added for clothing, \$28 per year—or a total cost of \$132. These are the figures given in the report of the Perkins Institution, a Massachusetts asylum for the blind, in October, 1874. It must be remembered, however, that these individuals are not producers; they do not earn what they otherwise would, and this amount must be added to the cost. Taking the lowest estimate of a man's wages at \$1.20 for each working day, supposing that not one among them all could become a skilled artisan, and counting the wages of the women at only 40 cents a working day, we find there is a total yearly loss to the community, cost and wages for each man, of \$404, and for each woman of \$256. This at the very minimum estimate amounted, in New York in 1880, to \$1,682,136, and over \$25,000,000 in 1888 for the entire United States.

If these statements are of as much importance as they would appear, it behooves us at least to inquire what steps can be taken for lessening the increase of blindness. In a paper like this it is possible only to refer briefly to points which are of primary importance without attempting detail in any respect. At present, however, if we were to suggest a plan it would be about as follows:

First. To popularize with the profession and laity the necessity of some care as to the proper cleansing of the eyes of infants immediately after birth; to impress the importance of this matter upon nurses, hospital attendants, and others, and, if possible, to teach them to apply to every infant's eyes a suitable solution of nitrate of silver, which need never be stronger than two per cent. and of maximum quality.

Second. Enactments should be encouraged similar to that recently passed by the New York State Legislature in regard to the proper isolation and quarantining of children with suspicious diseases of the eyes in all residential schools and in large institutions in which children are brought together. Moreover, similar rules, with proper modifications, should be adopted in prisons, reformatories, and other institutions for adults; especially does this hold good concerning soldiers in barracks and sailors on shipboard.

Third. By educating the public. The laity should be cautioned as to the contagious character not only of the so-called granular lids but especially of those severe forms of inflammation of the eye which

result from inoculating it with gonorrhœal matter. This might be accomplished by posting notices in proper places, officially signed by the Board of Health or other proper officers; other proper notices posted in stone quarries, machine-shops, etc., would tend to lessen the proportion of accidents to eyes, so frequent in these places.

Fourth. That steps be taken to prevent the introduction into this country, by immigration, of cases of contagious diseases of the eye.

Fifth. That renewed efforts be made by the profession to collect data relating to bacteria affecting the eye—especially to the action of the gonococcus, the so-called trachoma coccus of Michel, and other forms of either the normal or diseased conjunctiva.

In submitting this report the Committee is impressed with the fact that any such presentation of statistics and recommendations is entirely inadequate to give a proper idea of the importance of the subject. In order to condense the statement as much as possible, it has been necessary to omit certain phases of the question entirely. The distribution of blindness in different portions of the State, the relation of certain causes which produces it, to altitude, to density of population and other factors, have been entirely omitted for the sake of brevity. The bacteriological questions which it involves have been hardly referred to, although considerable data have been accumulated relating to the causes of the disease here; by a personal examination of the same causes as they exist in Egypt, in Finland, and in other countries where blindness is of frequent occurrence. It is hoped, however, that these few facts, though imperfectly presented, may arouse some slight interest in the subject, and in doing so, tend to lessen the number of those most unfortunate and most pitiable of human beings—the blind.

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